

CLAIMS

1. (PREVIOUSLY PRESENTED) A method of fabricating a chemical array using:

a head system with multiple groups of drop dispensers which move in unison, wherein each group comprises a series of drop dispensers within the group loaded with a same fluid;

a transport system to move the head system with respect to a substrate with different dispensers in the series of each group following respective paths;

a processor to dispense droplets from dispensers in a pattern along a selected path for each group during operation of the transport system, so as to form the array;

the method comprising:

- a) identifying an error in one or more dispensers;
- b) when a dispenser of the series within a first group is in error, then moving a second dispenser of the series of each group along the selected path for its group while dispensing droplets from at least the second dispenser of the series of the first group in at least part of the pattern for the selected path of the first group.

2. (CURRENTLY AMENDED) A method according to claim 1 wherein in step (b) droplets are dispensed from each second dispenser of the series within each of multiple groups in at least part of the pattern for the selected path of the group the group containing that series.

3. (CANCELED)

4. (PREVIOUSLY PRESENTED) A method according to claim 2 wherein:

a series of dispensers within a group communicate with a corresponding common reservoir for that series.

5. (ORIGINAL) A method according to claim 1 wherein the dispensers are pulse jets.

6. (PREVIOUSLY PRESENTED) A method according to claim 2 wherein in step (b) the droplets are dispensed from a second dispenser of a series in a complete pattern for the first dispenser of the series containing the second dispenser.

7. (PREVIOUSLY PRESENTED) A method according to claim 2 wherein in step (b) the droplets are dispensed from at least one second dispenser of the first group, in a complete pattern for the selected path of the first group.

8. (ORIGINAL) A method according to claim 2 wherein when a second dispenser of a second group is additionally in error, the first and second dispensers of each group are alternately moved along the selected path for that group while droplets are dispensed from non-error dispensers of the first and second groups in at least part of the pattern for the selected paths for the first and second groups.

9. (PREVIOUSLY PRESENTED) A method of fabricating a chemical array using:

a head system with multiple groups of drop dispensers which move in unison, wherein each group comprises multiple rows and columns of dispensers and wherein for each column of each group dispensers of a same column within a group are loaded with a same fluid;

a transport system to move the head system with respect to a substrate with different rows following respective paths;

a processor to dispense droplets from dispensers during operation of the transport system, in a pattern along a selected path for each group, so as to form the array;

the method comprising:

a) identifying an error in one or more dispensers;
b) when dispensers of different columns within first and second rows of a first group are in error, then:

(i) positioning the head with a first row of each group aligned with the selected path for that group;

(ii) moving the head with respect to the substrate while dispensing droplets from non-error dispensers in the first row of the first group in accordance with a part of the pattern for the selected path for that group;

(iii) re-positioning the head such that a second row of each group is aligned with the selected paths; and

(iv) moving the head with respect to the substrate while dispensing droplets from non-error dispensers in the second row of the first group in accordance with a part of the pattern for that group.

10. (ORIGINAL) A method according to claim 9 wherein the dispensers are pulse jets.

11. (ORIGINAL) A method according to claim 9 wherein in step (b)(iv) droplets are dispensed from non-error dispensers in the second row of each of multiple groups in accordance with at least part of the pattern for each group.

12. (CURRENTLY AMENDED) A method according to claim 9 wherein:

~~— a series of dispensers in each of multiple columns of each of multiple groups, wherein~~ for each column of each group dispensers of a same column within a group are loaded with a same fluid by communicating with a corresponding common reservoir for that column within the group; and

in step (b)(iv) droplets are dispensed from a non-error dispenser of a same column in a group as the error dispenser.

13. (PREVIOUSLY PRESENTED) A method according to claim 9 wherein in step (b)(iv) droplets are dispensed from at least one second row of a group in the complete pattern for the selected path of the group containing that second row.

14. (PREVIOUSLY PRESENTED) An apparatus for fabricating a chemical array, comprising:

(a) a head system with multiple groups of drop dispensers which move in unison, wherein each group comprises a series of drop dispensers within the group loaded with a same fluid;

(b) a transport system to move the head system with respect to a substrate with different dispensers in the series of each group following respective paths;

(c) a processor which:

dispenses droplets from dispensers in a pattern along a selected path for each group during operation of the transport system, so as to form the array; and

when an error indication is identified by the processor indicating an error in a first dispenser of the series of the first group, then moves a second dispenser of the series of each group along the selected path for its group while dispensing droplets from at least the second dispenser of the series of the first group in at least part of the pattern for the selected path of the first group.

15. (ORIGINAL) An apparatus according to claim 14 wherein the dispensers are pulse jets.

16. (PREVIOUSLY PRESENTED) An apparatus according to claim 14 wherein the processor, when the error indication is identified, dispenses droplets from each second dispenser of the series within each of multiple groups in at least part of the pattern for the selected path of the group containing that series.

17. (CURRENTLY AMENDED) An apparatus according to claim 16 wherein: a column of dispensers within a group communicate with a corresponding common reservoir for ~~that~~the column.

18. (PREVIOUSLY PRESENTED) An apparatus according to claim 16 wherein, when the error indication is identified, the processor dispenses droplets from the second dispenser of a series in a complete pattern for the first dispenser of the same series.

19. (PREVIOUSLY PRESENTED) An apparatus according to claim 16 wherein, when the error indication is identified, the processor dispenses droplets from at least one second dispenser of the first group in a complete pattern for the selected path of the first group.

20. (PREVIOUSLY PRESENTED) A method according to claim 16 wherein when another error indication is identified by the processor additionally indicating an error in the second dispenser of a second group, the processor alternately moves the first and second dispensers of each group along the selected path for that group while dispensing droplets from non-error dispensers of the first and second groups in different parts of the pattern for the selected path for the first group.

21. (PREVIOUSLY PRESENTED) An apparatus for fabricating a chemical array, comprising:

(a) a head system with multiple groups of drop dispensers which move in unison, wherein each group comprises multiple rows and columns of dispensers and wherein for each column of each group dispensers of a same column within a group are loaded with a same fluid;

(b) a transport system to move the head system with respect to a substrate with different rows following respective paths;

(c) a processor which:

dispenses droplets from dispensers during operation of the transport system, in a pattern along a selected path for each group so as to form the array;

when an error indication is identified by the processor indicating an error in dispensers of different columns within first and second rows of a first group, then:

(i) positions the head with a first row of each group aligned with the selected path for that group;

(ii) moves the head with respect to the substrate while dispensing droplets from non-error dispensers in the first row of the first group in accordance with a part of the pattern for the selected path for that group;

(iii) re-positions the head such that a second row of each group is aligned with the selected paths; and

(iv) moves the head with respect to the substrate while dispensing droplets from non-error dispensers in the second row of the first group in accordance with a part of the pattern for that group.

22. (ORIGINAL) An apparatus according to claim 21 wherein the dispensers are pulse jets.

23. (PREVIOUSLY PRESENTED) An apparatus according to claim 21 wherein in step (iv) droplets are dispensed from non-error dispensers in the second row of each of multiple groups in accordance with at least part of the pattern for each group.

24. (PREVIOUSLY PRESENTED) An apparatus according to claim 21 wherein: for each column of each group dispensers of a same column within a group are loaded with a same fluid by communicating with a corresponding common reservoir for that column within the group ; and in step (iv) droplets are dispensed from a non-error dispenser of a same column as the error dispenser.

25. (ORIGINAL) An apparatus according to claim 21 wherein in step (iv) droplets are dispensed from at least one second row of a group in the complete pattern for the selected path of the same group.

26. (ORIGINAL) An apparatus according to claim 21 additionally comprising a sensor to monitor dispensers for an error and provide corresponding data to the processor.

27. (PREVIOUSLY PRESENTED) A computer program product for use with an apparatus for fabricating a chemical array having:
a head system with multiple groups of drop dispensers which move in unison, wherein each group comprises a series of drop dispensers within the group loaded with a same fluid;

a transport system to move the head system with respect to a substrate with different dispensers of the series of each group following respective paths; and a processor;

the computer program product comprising a computer readable storage medium having a computer program stored thereon which, when loaded into the processor, performs the steps of:

- a) identifying for an error in one or more dispensers;
- b) when a dispenser of the series within a first group is in error, then moving a second dispenser of the series of each group along a selected path for its group while dispensing droplets from at least the second dispenser of the series of the first group in at least part of the pattern for the selected path of the first group.

28. (PREVIOUSLY PRESENTED) A computer program product according to claim 27 wherein in step (b) droplets are dispensed from each second dispenser of the series within each of multiple groups in at least part of the pattern for the selected path of the group containing that series.

29. (ORIGINAL) A computer program product according to claim 27 wherein when a dispenser of a second set of the first group is additionally identified as being in error, the program causes the first and second dispensers of each group to be alternately moved along the selected path for that group while droplets are dispensed from non-error dispensers of the first and second groups in different parts of the pattern for the selected path for the first group.

30. (PREVIOUSLY PRESENTED) A method according to claim 1 wherein the array comprises biopolymer features.

31. (PREVIOUSLY PRESENTED) A method according to claim 1 wherein the array carries polynucleotide containing features.

32. (PREVIOUSLY PRESENTED) A method according to claim 1 wherein the array carries features with polynucleotides of different sequence.

33. (PREVIOUSLY PRESENTED) A method according to claim 30 wherein the array comprises peptide containing features.